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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,608	06/28/2001	Nawalage Florence Cooray	122.1457	4846

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EXAMINER

RIBAR, TRAVIS B

ART UNIT	PAPER NUMBER
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1711

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DATE MAILED: 01/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/892,608

Applicant(s)

COORAY, NAWALAGE
FLORENCE

Examiner

Travis B Ribar

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Unexamined Patent Publication (JPX) No. 11-236450 in view of Smith et al. ('372).

The applicant claims in claims 1 and 2 compositions for a thermally curable fluorinated o-aminophenol polymer or oligomer. Claim 1 includes the provision that the polymer be based on an o-aminophenol and an aromatic dicarboxylic acid compound where one or both of the compounds are at least partially fluorinated. The polymer is also claimed to have end groups that are capable of crosslinking at elevated temperatures. Claim 2 includes the limitations of claim 1 and adds that either the o-aminophenol or the dicarboxylic acid must contain a partially fluorinated benzene ring or a fluorinated moiety.

JPX 11-236450, included in the applicant's information disclosure sheet, discloses a polymer that fulfills the requirements set forth by the applicant in claims 1 and 2, with the exception that the polymer does not include thermosetting end groups. The thermally curable fluorinated polymer shown in JPX 11-236450 is synthesized from an o-aminophenol and an aromatic dicarboxylic acid, one or both of which contain

fluorinated elements, fulfilling the requirements of claim 1 (with the exception of the end groups). Further, JPX 11-236450 shows the use of o-aminophenols or dicarboxylic acids containing benzene rings with fluorinated groups as starting materials for the polymer, meeting the requirements claim 2 (with the exception of the end groups). However, none of these formulations show the incorporation of thermosetting end groups into the polymer.

Smith et al. ('372) claims the inclusion of thermosetting end groups onto polymers (Smith et al. ('372) claim 1) to enable crosslinking. Smith et al. ('372) also states that this technology may be used in polybenzoxazoles (Smith et al. ('372) column 22, line 64 to column 23, line 13). Some advantages of crosslinking a material in this manner are taught within Smith et al. ('372), including lower water sorption and high thermal strength (Smith et al. ('372) column 19, line 64 to column 20, line 47). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to put thermosetting end groups, as shown in Smith et al. ('372), on the polymers claimed in JPX 11-236450 in order to utilize the lower water sorption and higher thermal strength present in a crosslinked system as opposed to a non-crosslinked system.

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murayama et al. in view of Smith et al. ('372).

The applicant's claims 1 and 2 are described above. Dielectric films obtained by heat curing the fluorinated polymer of either of claims 1 or 2, along with the heat curing

process used to produce the dielectric films, are claimed by the applicant in claims 3 and 6 and in claims 4 and 7, respectively. In addition, multilayer circuit boards comprising these dielectric films are claimed in claims 5 and 8.

Murayama et al. shows a fluorinated o-aminophenol polymer that fulfills the requirements set forth in claims 1 and 2 of the present invention with the exception of the inclusion of thermosetting end groups on the polymer. The compounds that Murayama et al. lists as components (column 4, line 6 to column 5, line 7) include some of the same materials used as polymer precursors in the present invention and fulfill the material properties set forth by the applicant in claims 1 and 2 (with the exception of the thermosetting end groups). The polymer that is created in Murayama et al. undergoes heat treatment to form a film (column 7, lines 18-26). The indication of a measurement of the dielectric constant of the resulting film (column 7, lines 27-32) shows that the film does constitute a suitable dielectric-film. Finally, Murayama et al. teaches the common use of the created material as the insulating layer of a multilayer circuit board (column 12, line 66 to column 13, line 6).

Smith et al. ('372) claims the inclusion of thermosetting end groups onto polymers (Smith et al. ('372) claim 1) to enable crosslinking. Smith et al. ('372) also states that this technology may be used in polybenzoxazoles (Smith et al. ('372) column 22, line 64 to column 23, line 13). Some advantages of crosslinking a material in this manner are taught within Smith et al. ('372), including lower water sorption and high thermal strength (Smith et al. ('372) column 19, line 64 to column 20, line 47). Since the explicit purpose of adding the thermosetting end groups to a polymer in Smith et al.

('372) is to crosslink, or cure, the polymer by heating it (Smith et al. ('372) claim 1), it is apparent that a polymer as shown in Murayama et al. that is end capped with thermosetting groups as in Smith et al. ('372) would cure when heated to form a dielectric film, fulfilling the applicant's claims 3-8. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to put thermosetting end groups, as shown in Smith et al. ('372), on the polymers claimed in Murayama et al. in order to utilize the lower water sorption and higher thermal strength present in a crosslinked system as opposed to a non-crosslinked system.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sezi et al. (U.S. Patent No. 6,153,350)

Smith et al. (U.S. Patent No. 6,323,301)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis B Ribar whose telephone number is (703) 305-3140. The examiner can normally be reached on 8:30-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Travis B Ribar
Examiner
Art Unit 1711

TBR
January 16, 2002


James J. Soldonk
Supervisory Patent Examiner
Technology Center 1700